itics a true civic spirit is chiefly sustained, and that they are therefore the primary duties of the American citizen, and especially of those who desire to promote a more intelligent patriotism and a better public opinion.

As it has so often been urged, so does this society urge upon every good citizen his duty to give earnest attention to the political and social questions of the day, — such questions as, at the present time, protection or free trade, prohibition or license the relations of capital and labor, the limits of state control of industries, immigration, and international arbitration. The society urges that it is the good citizen's duty, which we presume no one will deny, to dispel ignorance and to spread knowledge of facts on these subjects, and to foster a large and worthy spirit in dealing with them. They further urge that it is the citizen's office to make knowledge powerful and controlling by attending punctiliously to his own duties as a voter.

The advantages of lyceums, debating-clubs, and lectures as means in developing an intelligent interest in political subjects are urged, and it is believed that members of the society can do much to sustain these. The society proposes further to aid the efforts of the members by publishing all the really useful matter that it can, in tracts, in pamphlets, and in the newspapers, and it has charged a competent committee with the preparation and recommendation of courses in reading and study. Another committee will give advice and assistance in procuring good lecturers. The larger the membership of this society, the wider will be its field of operation, and it is naturally desirable that there should be as many as possible who will give careful attention to the matter of local organization.

SCIENTIFIC NEWS IN WASHINGTON.

Stocking the Pacific Ocean with Lobsters; the First Successful Experiment in transporting Them Alive across the Continent; the Difficulties of Artificial Lobster-Propagation; Only One or Two Mature Lobsters from 12,000 or 15,000 Eggs. — A Curious Iroquois Mythologic Tale. — The Contour of the Atlantic Ocean's Bed; a Beautiful Model sent to Cincinnati by the Hydrographic Office.

Sending Live Lobsters to California.

THE United States Fish Commission shipped from Wood's Holl, June 16, 600 live lobsters and 250,000 lobster-eggs. Of the former, 350 arrived safely in Sacramento, Cal., June 22, and they have been deposited in the Pacific north and south of San Francisco. Several previous attempts to take live lobsters across the continent have failed. Of those sent only as far as Chicago, packed in seaweed in crates, only one in four survives.

Colonel McDonald, fish commissioner, personally superintended the packing of the lobsters lately sent to California. A crate or box devised by the late Captain Chester was used. This was placed within another larger box, the intervening space being filled with pounded ice. In the inner box the lobsters were placed between layers of rockweed, which at times was moistened with seawater. Each box had an independent drain, so that the fresh water from the melting ice could not enter the lobster-box. The temperature of the latter was kept at 45° F. A fish-commission car was used, the boxes along the side of it serving as the outer box of the combination described above; one hundred crates, each containing six lobsters, being placed in them, and surrounded with ice. Each morning before sunrise a careful inspection of the lobsters was made, and those that had died were removed. The first day 45 died; the second day, 55. After that the mortality was much less. All of those that died were in an advanced state of shedding, and were in poor condition when they started.

One-half of the 350 lobsters that arrived safely on the Pacific coast were placed in the ocean north of San Francisco, and the other half south. It is hoped that this experiment may demonstrate the feasibility of stocking the waters of the Pacific on the California coast north of Monterey with this delicious shell-fish. The condition of the water in that region is quite similar to that of the Atlantic off the Massachusetts coast. The temperature is about the same, except that it is more constant. The lobster on the Massachusetts coast crawls out into deep water in the summer, where the temperature is low, but it is thought that the equable temperature of the Pacific will enable the lobster in those waters to spend the whole year in one spot.

Hatching-apparatus was taken to California with the 250,000 lobster-eggs shipped. The young lobsters produced by these eggs will be deposited in the sea at once. Although a fair trial will be made to determine the possibility of stocking the Pacific by artificial propagation, much more confidence of success is expressed by Colonel McDonald from the introduction of mature lobsters. The young lobsters have to be placed in the sea almost as soon as they are hatched, and begin to feed most voraciously, even devouring each other. For a few days they swim on the surface of the water, where they find food suited to their requirements, but where they also encounter millions of enemies. After their walking or crawling organs are developed, they sink to the bottom, which they then make their home. One of the problems which the United States Fish Commission is now attempting to solve is the invention of some method of keeping the little lobsters in confinement and safety after they are hatched, until they have attained sufficient strength and size to enable them to protect themselves. The importance of such an invention will be appreciated when it is known, that, from the 12,000 to 15,000 eggs produced by a female lobster in a year, not more than two lobsters, when left to nature, become full grown. Not only are almost all the little lobsters destroyed by their enemies, but a large proportion of the eggs are devoured by fish and seabirds before they are hatched. If, after artificially hatching the eggs, the Fish Commission could protect the young lobsters until they are large enough to take care of themselves, the supply of lobsters, which is now hardly equal to the demand, and would not one-half supply it if the price was reduced, might be increased almost indefinitely.

Iroquois Mythology.

The Bureau of Ethnology, in addition to the great variety of other work upon which it has been engaged, has almost from its first organization been collecting the quaint and curious stories prevalent among the Indians, translating and transcribing them, and arranging them for future comparison and study. Most of these stories are mythological; and it is one of the most curious and interesting facts, recently discovered, that the life of certain tribes of Indians is almost exclusively a religious one, far more so than that of the ancient Hebrews in any period of their history, and that the religious element is more intimately interwoven in the daily life of all the tribes than has heretofore been suspected. In the light of this discovery, the legends and mythologic tales that the Bureau of Ethnology has preserved, and to the stock of which almost daily additions are made, become of greater scientific value than ever before.

As an illustration of the character of some of these stories, the following obtained from the Iroquois, entitled 'Hinohoawak and his Grandmother,' is interesting, first, because, although all the characters in it are personified, not one of them is a human being; and, second, because of the picturesque and graphically vivid style in which the story is told. 'Hinohoawak,' translated, means 'the son of thunder.'

"There was a very poor old woman who lived in the woods. She was nothing but skin and bones. She lived in a smoky little house, and she cried all the time, both day and night. Her blanket was so old and dirty that no one could tell of what material it was. She had seven daughters. Six of these were carried off one after another by people. The seventh died.

"The daughter that died had been buried some time, when the old woman heard crying at the grave one night. She took a torch, went out, and found a naked baby. The child had crawled up out of the grave through a hole in the earth. The old woman wrapped the naked baby in her blanket and took it home. She didn't know her daughter was with child when she died. She did not suspect it.

"The infant, a little boy, grew very fast. When he was of good size, she came home one day from gathering wood, and could not find him. That night it stormed, thundered and rained. The child returned to her in the morning. His grandmother asked, 'Where have you been, my grandson?' — 'My grandmother,' said he, 'I have been with my father: he took me home.' — 'Who is your father?' — 'Hino ['Thunder'] is my father. He took me

home first, then we came back, and were all around here last night.' The old woman asked, 'Was my daughter in the grave your mother?'—'Yes,' said the boy, 'and Hino used to come and see my mother.'

"The old woman believed him; and as he grew he used to make a noise like thunder; and whenever Hino came into the neighborhood, he would go out and thunder, and help his father. He was Hinohoawak, son of Hino.

"After some time he asked his grandmother where his six aunts were, and his grandmother answered, 'There is an old woman, and her son Yeq-hdjiho-wa-wak, whose house is far away, and they live by playing dice and betting. Your aunts went one by one with a company of people, played, were beaten, and had their heads cut off. Many men and women have gone to the same place and lost their heads.' Hinohoawak said, 'I will go, too, and kill that woman and her son.' The old woman tried to keep him at home, but he would not stay with her. He told her to make two pairs of moccasons for him. He was very ragged and dirty, and she made the moccasons, and got him the skin of a flying squirrel for a pouch.

"He set off to the west, and soon he came to a great opening where there was a large bark house with a pole in front of it, and on the pole a skin robe. He saw boys playing ball in the opening, and went on a side-path and heard a great noise. By and by the people saw him, and one of them said, 'I don't know where that boy comes from.'

"The old people were betting, and the boys playing ball. Soon an old man came up to Hinohoawak and gave him a club; and he played so well that the old man came again and said, 'We want you to play dice: we will bet with you, all the people.' A bowl was placed on an elk-skin under the pole. The woman and her son were there, and the people were standing around.

"Hinohoawak answered, 'I don't know the game;' but the old man said, 'We will risk our heads on you.' So he followed the old man. He saw a white stone bowl as smooth as glass. The old woman was sitting there on the elk-skin ready to play, and Hinohoawak knelt right down by the bowl. She said, 'You play first.'—'No,' said he, 'you play first.' So she took the dice,—round ones, made out of peach-stones,—blew on them, and threw them into the bowl, which she shook. The dice flew up into the air, and all turned into crows, cawing as they went out of sight. After a while they came down, cawing, and turned back into peach-stones as they touched the bowl. The old woman was to play three times, and must get seventeen. She threw three times, but got nothing.

"Then Hinohoawak, to win, took dice out of his pouch of flying-squirrel skin. The old woman wanted him to use her dice, but he wouldn't touch them. He shook the bowl, and ducks flew up. They went very high, and all the people heard them as they rose. When they touched the bowl they were peach-stones again, and counted ten. Then Hinohoawak shook the bowl again, and called, 'Game! game!' but the old woman called out, 'No game!' Back they came and counted another ten. He tried the third time, and made ten more. He had won.

"Then he called the people to come and see him cut off the heads of the old woman and her son. 'No,' said the old woman, 'you must play again. Here is my son. You must play ball with him; and if he loses, we shall both forfeit our heads.' Then Hinohoawak asked the old man what he thought. The people, seeing how smart he was, said, 'Play;' and he went to the ball-ground ragged and poor-looking. There were but two playing, one on each side. Then Hinohoawak jumped, and knocked the club out of his antagonist's hand. Then Yage-hdji-ho-wak ran for his club, but before he could get it back, Hinohoawak had sent the ball through the barrier. This was repeated seven times, and Hinohoawak won the game. 'Now,' said he to all the people, 'you can have the heads of the old woman and her son.' The two heads were cut off, and the boys played with the old woman's head over the whole field. 'Now,' said Hinohoawak, 'I am going to bring my grandmother to this place, and we must all come here to stay, and have this long house to live in.' All went home to their houses; and as he went, he sang praises of himself, and his grandmother heard him on his way. He told her what he had done, and said, 'We must all go there and live in that nice house and field.' She got provisions ready, and they went. It took them a long time to reach the place. All the others came too, and built houses around in the field. When all the people had settled down, Hinohoawak went out and called them to the council-house to have a dance. After they had finished the dance, all went home.

"The grandmother put away her old blanket, and began to dress. She put on the clothes left by the old woman who lost her head, and soon she looked like a young woman, and they lived happily. After a while, Hinohoawak went off with Hino, his father, and staid all winter with him.

"In the spring the old woman was uneasy in mind. She heard thunder in the west, and pretty soon her grandson came to the house, and she was very glad to see him.

"'Where have you been?' she asked. 'At the great mountain far off in the west. I have been with my father, helping the nations and protecting men.'

"After that he staid at home all summer. Once in a while he would go away when it began to storm, but he came back again when the weather was good. He lived a long time in this way, till at last he said to his grandmother, 'I have an uncle living in the west. Some witch stole him from you. I must go and find him.' And so he went to the west to search for his uncle. He went on till he came to a house in which he saw a woman sitting by a fire, with her head on her hands. She wouldn't answer when he asked where his uncle was. By and by he went out, took the war-club from his pouch, knocked her on the head, and killed her.

"When he had killed the woman, he went out and walked all around the house, mourning, and looking for his uncle. He looked into the trees, but couldn't see any one; he looked upon the ground, but couldn't find him. By and by he came to a large slippery-elm tree, and the great roots held down a man. His head came out between two roots on one side, and his feet between two more on the other. The tree stood right on the middle of his body, and he was calling to his nephew to give him a smoke. And the nephew said, 'Oh, poor uncle! I'll give you a smoke pretty soon.'

"Then he kicked the tree over, saying, 'Rise up, uncle;' and the uncle rose up and was well. Then Hinohoawak took out his pouch and gave the old man a smoke. The uncle was very much pleased and strengthened. Then he told his nephew how the woman had beguiled him to go with her, pretending that she wanted to marry him; and when she had him at her house, she ate him up, and put his bones under the elm-tree. Then both went home to the long house. The old grandmother was surprised and glad. All lived happily there till one day when Hinohoawak went off in a storm. When the storm was over, he brought home a wife.

"When he went off after that with a storm, his wife was uneasy. She didn't know where he was. Hinohoawak had brought her such a long distance home on his back in the storm.

"After a time she had a son; and when the boy was large enough to run about, the old man, Hinohoawak's uncle, whose bones had lain under the elm-tree, began to teach him, and soon he was able to make a noise like thunder. One day the boy followed his mother out of the house. They had a little dog, and, as the boy was running after it, somebody seized him and rushed away; but the dog ran after him, managed to catch hold of his feet, pulled off his moccasons, and carried them home. This was the first indication the woman had that her boy was gone. Hinohoawak was off with a storm at the time, and when he came home his wife asked him if he had taken the boy. 'No,' said he. 'Oh, he is lost!' cried she. 'Oh, no! he is all right,' said Hinohoawak. 'He has many relations around the world, uncles and cousins.'

"The boy staid away all winter.

"When the winter was over, he came home one day with his father. Then Hinohoawak said to the people of his family, 'We must all move away and live with my father.' The old woman said, 'No, we cannot go, it is so far, and I am so old.'—'I'll carry you there in a little while,' said the grandson. Then Hinohoawak began to thunder, and lightning flew around. The house was torn to pieces, and blazed up in flames. All the rocks and houses in the opening were broken to bits. Hinohoawak and all of his people rose up in the air. The east wind began to blow and carry them

to the Rocky Mountains, where they found old Hino. All live there in the caves of the rocks."

Models of the Ocean's Bed.

The Hydrographic Office has sent to the Cincinnati exhibition a collection of charts, photographs, etc., illustrating the work of the office and the modes of doing it. These will be interesting to scientific men, teachers and students, but, except the photographs, are not likely to arrest the attention of the average visitor. But there are two plaster-of-Paris models in the collection that are certain to be examined with curiosity, and studied with profit, by every one who stops to look at them. They are models of the bed of the Atlantic Ocean and of that of the Caribbean Sea. These have been made by Mr. E. E. Court, of the Hydrographic Office, and the charts from which they were constructed have been carefully revised by Commander J. R. Bartlett and Lieut. J. L. Dyer, respectively former and present hydrographer.

Each of these models shows the contour of the bottom of the sea, that of the Atlantic embracing the whole ocean from latitude 60° north to latitude 40° south, or from Greenland in the north to the unknown region in the south, and includes the Mediterranean Sea on the east, and the Caribbean Sea and a part of the Gulf of Mexico on the west. The chart from which the necessary data were plotted in order to make the model was compiled on a very large scale from the charts of the United States and all foreign hydrographic offices, the very latest deep-sea soundings having been utilized. The contour-lines are drawn according to these soundings. This chart, while it tells the whole story to the experienced hydrographer, — the figures with which it is covered possibly conveying to his mind a picture of how the bed of the Atlantic would look if spread out before him so that he could get a bird's-eye view of it, — is entirely meaningless to the great mass of people. But in the model that is constructed from the chart every depression of the ocean is represented by a corresponding depression in the plaster-of-Paris; so that even a child, with a few words of explanation, can obtain from it a clearer, more vivid, and more correct idea of how the bed of the ocean looks than the man of science could obtain from a chart.

The horizontal scale of the chart and model is sixty nautical miles, or one degree of longitude, on the equator, to each six-tenths of an inch; and the vertical scale is fifty times as great as the horizontal.

The original model was made of wooden boards, one-eighth of an inch thick, each layer representing 250 fathoms of actual depth of the sea. The intermediate soundings are also very carefully represented by carvings of the boards. When the entire contour had been fully represented in the wooden model, a plaster-of-Paris cast was made from it, and this was carefully painted so as to represent in their actual colors, as shown by deep-sea soundings, the mud at the bottom of the sea. As the depth increases each thousand fathoms, the shade becomes darker and darker, the darkest being in the deepest place known, — 4,561 fathoms, or about 5.2 statute miles.

There are many things shown by this model that will be surprising to almost everybody except the expert hydrographer. One of these is the great height of many of the small islands from the ocean's bed, when compared with their area either above the surface of the water or where they rest upon the bottom of the sea. Of course, this height is exaggerated in the model by making the perpendicular scale fifty times as great as the horizontal scale; but, even allowing for that, these islands stand up like tall, narrow, truncated cones, many of them not being more than twice as far across at the base as at the top.

The model of the bed of the Caribbean Sea was designed by Commander J. R. Bartlett, and the chart was compiled from deep-sea surveys made by himself and by Lieut.-Commanders W. H. Brownson and Z. L. Tanner. The latest soundings are embodied in it. In this model, of which the horizontal scale is thirty-three miles to an inch and the vertical thirty-three times the horizontal, the topography of the land is given in the same proportion as the depths of the sea.

Duplicates, or even photographs, of these models would be of very great value in the teaching of physical geography. That of the bottom of the Atlantic Ocean would give a pupil more actual instruction in a quarter of an hour than a week's study of descriptive text.

ELECTRICAL SCIENCE.

Continuous and Alternating Currents.

IN the last few months discussions have taken place, both in England and this country, as to the relative value of continuous and alternating currents for the distribution of electrical energy. In England the employment of storage-batteries with the continuous current has been advocated: here the simple direct system has been pitted against the alternating. We have noticed these discussions from time to time: now that they are finished, it will be well to sum up the results.

The alternating system, employing induction-coils or transformers, has the advantage of allowing the current to be distributed at a high potential to the points of consumption, and therefore it requires distributing-wires of comparatively small section. There seems little doubt, as matters now stand, that it is best for scattered towns, or even in cities if the lighting is mainly confined to theatres, clubs, stores, etc., which are at a considerable distance apart, and which are to be supplied from a central station. When it comes to domestic lighting, however, where we wish to supply entire districts in cities with electric lights instead of gas, the case is different. Let us consider the availability of the three systems — alternating, direct, and direct with storage — for this purpose. The practice with the alternating system at present is to have a transformer for each house to which lights are supplied. When a large number of houses are to be supplied in a city district, this plan cannot be economically carried out, especially if the wires are forced under ground. The insulation of such a complicated network of high-potential wires would be difficult and expensive, — almost impracticable, in fact. Again: as each house would have a transformer whose capacity would be the maximum number of lights that would be used, and as the average number of lights is only a small fraction of the maximum, the transformers — which are not economical when their load is small — would have a low average efficiency. If the alternating system is to be introduced into cities to seriously displace gas, it must be on some such plan as Mr. Kapp proposes. Large converters are placed at different points in the district to be lighted, and the current is distributed at low potential from these. It will be found, if this is done, that the saving in wire is not so large as might be expected, for the greatest expense will be in the low-potential distributing-mains.

The only storage-battery system in extended practical use is that employed by Mr. Crompton. A number of sets of cells are distributed in sub-stations through the district to be lighted, the different sets are connected in series, and the lamp-circuits are taken from the terminals of each set of cells. The batteries act then partly as a converter, allowing high-tension currents for distribution, with a comparatively small difference of potential at points of consumption. Another advantage lies in the fact that the cells can be charged when the demand is light, and discharged at the time of maximum demand, thus allowing a smaller generating-plant. Mr. Crompton claims a high efficiency for the arrangement, and he is no doubt right. There is a loss, of course, in the part of the energy stored, but very little in that converted; and, as the former is not a large part of the total output, an efficiency of eighty-five per cent is not improbable. Mr. Crompton also claims that the repairs of the battery will not amount to more than ten per cent of their cost. The disadvantage of this system lies in the fact, that, with batteries in the circuit, insulation is difficult; and while the difference of potential between the leads taken from the two ends of a set of cells is only, say, one hundred volts, yet the difference of potential between these and the ground depends on the position of the set, and might be high. In fact, we have the disadvantage of distributing at a comparatively high absolute potential, with all the difficulty of insulation that it entails.

The simple direct system has the advantages of a high efficiency and simplicity, and it is economical within a limited area of distribution. It has the disadvantages that the station must be located near the centre of the district to be illuminated, and the area of operation is restricted.